

[Home](#) [PubMed](#) [GenBank](#) [BLAST](#)[Sign In](#) | [My NCBI](#)



A division of the *National Library of Medicine*
at the *National Institutes of Health*









Table of Contents[My NCBI Home](#)[My Saved Data](#)[Search Filters](#)[Preferences](#)[About My NCBI](#)

[Sign In or Register](#)
to see all of My NCBI.

Recent Activity shows searches and records for the last **8 hours**.

[Register](#) or [Sign in](#) and your activity will be automatically recorded for up to 6 months. We will permanently store search queries and records.

Actions:    Sort by:  ☐ **Select/Deselect All**Search: ☐ **Today**

<input type="checkbox"/>	21-Nov-2009 3:09 PM	PubMed		"podobnik"[All
<input type="checkbox"/>	21-Nov-2009 3:08 PM	PubMed		Production of
<input type="checkbox"/>	21-Nov-2009 3:08 PM	PubMed		"podobnik" AN
<input type="checkbox"/>	21-Nov-2009 3:07 PM	PubMed		"gaberc porek
<input type="checkbox"/>	21-Nov-2009 3:07 PM	PubMed		"gaberc porek
<input type="checkbox"/>	21-Nov-2009 3:07 PM	PubMed		"gaberc porek
<input type="checkbox"/>	21-Nov-2009 3:07 PM	PubMed		"menart" AND
<input type="checkbox"/>	21-Nov-2009 3:06 PM	PubMed		"menart" AND
<input type="checkbox"/>	21-Nov-2009 3:05 PM	PubMed		"menart" AND
<input type="checkbox"/>	21-Nov-2009 3:04 PM	PubMed		sulfobetaine n
<input type="checkbox"/>	21-Nov-2009 3:04 PM	PubMed		sulfobetaine g
<input type="checkbox"/>	21-Nov-2009 3:04 PM	PubMed		sulfobetaine

[Help Desk](#) | [Copyright](#) | [Disclaimer](#) |[Privacy](#) | [Accessibility](#) | [Contact](#)

National Center for Biotechnology Information, U.S. National
Library of Medicine
8600 Rockville Pike, Bethesda MD, 20894 USA

PubMed

U.S. National Library of Medicine
National Institutes of Health

"podobnik"[All Fields] AND ("granulocyte colony-stimulating factor"[MeSH Terms]

Search Details

Query Translation:

```
"podobnik"[All Fields] AND ("granulocyte colony-stimulating  
factor"[MeSH Terms] OR ("granulocyte"[All Fields]  
AND "colony-stimulating"[All Fields] AND "factor"[All  
Fields]) OR "granulocyte colony-stimulating factor"[All  
Fields] OR "g csf"[All Fields] OR "granulocyte colony  
stimulating factor, recombinant"[MeSH Terms] OR  
("granulocyte"[All Fields] AND "colony"[All Fields]  
AND "stimulating"[All Fields] AND "factor"[All Fields]  
AND "recombinant"[All Fields]) OR "recombinant granulocyte  
colony stimulating factor"[All Fields])
```

Search | URL

Result:

1

Database:

PubMed

User query:

"podobnik"[All Fields] AND ("granulocyte colony-stimulating factor"[MeSH Terms] OR ("granulocyte"[All Fields] AND "colony-stimulating"[All Fields] AND "factor"[All Fields]) OR "granulocyte colony-stimulating factor"[All Fields] OR "g csf"[All Fields] OR "granulocyte colony stimulating factor, recombinant"[MeSH Terms] OR ("granulocyte"[All Fields] AND "colony"[All Fields] AND "stimulating"[All Fields] AND "factor"[All Fields] AND "recombinant"[All Fields]) OR "recombinant granulocyte colony stimulating factor"[All Fields])

PubMed

U.S. National Library of Medicine
National Institutes of Health

Display Settings: Abstract

Biotechnol Prog. 2005 Mar-Apr;21(2):632-9.

Production of nonclassical inclusion bodies from which correctly folded protein can be extracted.

Jevsevar S, Gaberc-Porekar V, Fonda I, Podobnik B, Grdadolnik J, Menart V.

Lek Pharmaceuticals d.d., Verovskova 57, SI-1000 Ljubljana, Slovenia. simona.jevsevar@ki.si

Human granulocyte-colony stimulating factor (hG-CSF), an important biopharmaceutical drug used in oncology, is currently produced mainly in *Escherichia coli*. Expression of human hG-CSF gene in *E. coli* is very low, and therefore a semisynthetic, codon-optimized hG-CSF gene was designed and subcloned into pET expression plasmids. This led to a yield of over 50% of the total cellular proteins. We designed a new approach to biosynthesis at low temperature, enabling the formation of "nonclassical" inclusion bodies from which correctly folded protein can be readily extracted by nondenaturing solvents, such as mild detergents or low concentrations of polar solvents such as DMSO and nondetergent sulfobetaines. FT-IR analysis confirmed different nature of inclusion bodies with respect to the growth temperature and indicated presence of high amounts of very likely correctly folded reduced hG-CSF in nonclassical inclusion bodies. The yield of correctly folded, functional hG-CSF obtained in this way exceeded 40% of the total hG-CSF produced in the cells and is almost completely extractable under nondenaturing conditions. The absence of the need to include a denaturation/renaturation step in the purification process allows the development of more efficient processes characterized by higher yields and lower costs and involving environment-friendly technologies. The technology presented works successfully at the 50-L scale, producing nonclassical inclusion bodies of the same quality. The approach developed for the production of hG-CSF could be extended to other proteins; thus, a broader potential for industrial exploitation is envisaged.

PMID: 15801811 [PubMed - indexed for MEDLINE]

MeSH Terms, Substances

LinkOut - more resources

PubMed

"gaberc porekar" G-CSf

Filter your results: All (4)

U.S. National Library of Medicine
National Institutes of Health

Display Settings: Summary, Sorted by Recently Added

Are you looking for gene information?

gcsf granulocyte colony stimulating factor [Danio rerio]

gcsf in [Danio rerio](#) | [Homo sapiens](#) | [Mus musculus](#) | [All 7 Gene records](#)

Results: 4

1. [Engineering inclusion bodies for non denaturing extraction of functional proteins.](#)
Peternel S, Grdadolnik J, Gaberc-Porekar V, Komel R.
Microb Cell Fact. 2008 Dec 1;7:34.
PMID: 19046444 [PubMed - in process]
[Free article](#)
2. [New properties of inclusion bodies with implications for biotechnology.](#)
Peternel S, Jevsevar S, Bele M, Gaberc-Porekar V, Menart V.
Biotechnol Appl Biochem. 2008 Apr;49(Pt 4):239-46.
PMID: 17708747 [PubMed - indexed for MEDLINE]
3. [Chemometric approach in quantification of structural identity/similarity of proteins in biopharmaceuticals.](#)
Zuperl S, Pristovsek P, Menart V, Gaberc-Porekar V, Novic M.
J Chem Inf Model. 2007 May-Jun;47(3):737-43. Epub 2007 Apr 26.
PMID: 17458952 [PubMed - indexed for MEDLINE]
4. [Production of nonclassical inclusion bodies from which correctly folded protein can be extracted.](#)
Jevsevar S, Gaberc-Porekar V, Fonda I, Podobnik B, Grdadolnik J, Menart V.
Biotechnol Prog. 2005 Mar-Apr;21(2):632-9.
PMID: 15801811 [PubMed - indexed for MEDLINE]

PubMed

"menart" g-csf

Filter your results: All (3)

U.S. National Library of Medicine
National Institutes of Health

Display Settings: Summary, Sorted by Recently Added

Are you looking for gene information?

gcsf granulocyte colony stimulating factor [Danio rerio]

gcsf in [Danio rerio](#) | [Homo sapiens](#) | [Mus musculus](#) | [All 7 Gene records](#)

Results: 3

1. [New properties of inclusion bodies with implications for biotechnology.](#)
Peternel S, Jevsevar S, Bele M, Gaberc-Porekar V, Menart V.
Biotechnol Appl Biochem. 2008 Apr;49(Pt 4):239-46.
PMID: 17708747 [PubMed - indexed for MEDLINE]
2. [Chemometric approach in quantification of structural identity/similarity of proteins in biopharmaceuticals.](#)
Zuperl S, Pristovsek P, Menart V, Gaberc-Porekar V, Novic M.
J Chem Inf Model. 2007 May-Jun;47(3):737-43. Epub 2007 Apr 26.
PMID: 17455952 [PubMed - indexed for MEDLINE]
3. [Production of nonclassical inclusion bodies from which correctly folded protein can be extracted.](#)
Jevsevar S, Gaberc-Porekar V, Fonda I, Podobnik B, Grdadolnik J, Menart V.
Biotechnol Prog. 2005 Mar-Apr;21(2):632-9.
PMID: 15801811 [PubMed - indexed for MEDLINE]